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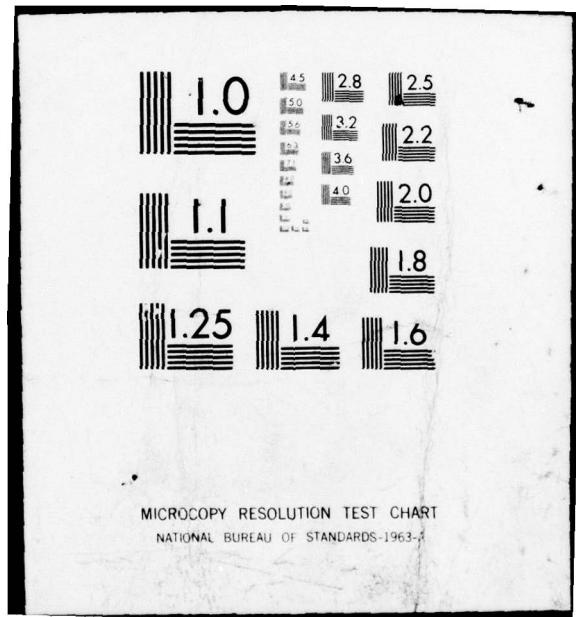
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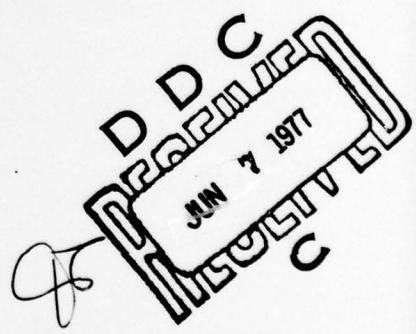
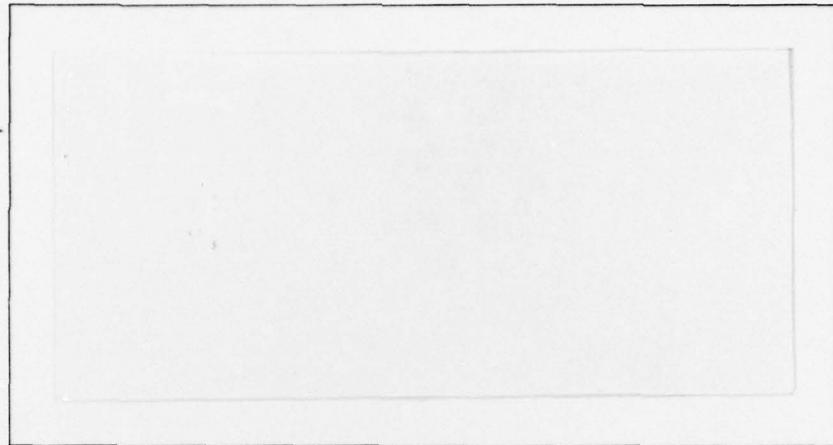


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Final Report on ONR Contract N00014-76-C-0024

"The Social Structure of Decision Making"

Yale University

School of Organization and Management

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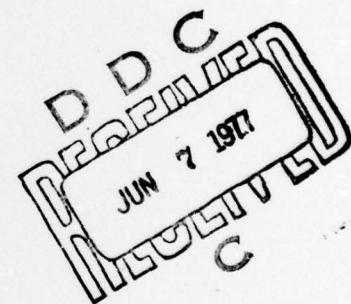
Victor H. Vroom
Principal Investigator

May 13, 1977

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In December 1971, the principal investigator, then at Carnegie Mellon University, received a contract from the Office of Naval Research to study leadership styles in organizations as they are reflected in different social processes for decision-making. With the exception of a four month interruption occasioned by the author's move to Yale University, the financial support continued until February 1977.

Issues of leadership have long been of interest to social scientists but most assessments of progress have been harsh whether the criterion has been improved understanding of the complexities of the process or the generation of methods for enhancing the quality of leadership in contemporary organizations.

Our approach to examination of leadership was different in several aspects from what went before. In addition to focusing on the behavior of the leader, rather than personal traits such as dominance or intelligence, it carefully delimited the realm of leader behavior to be examined--restricting it to the leader's role in the decision-making process. We also carefully distinguished normative issues involved in leader behavior, i.e., how leaders should behave in order to best attain organizational goals, from descriptive issues, i.e., how leaders do behave, including the role of individual and situational differences in determining that behavior.

From the outset, the plans for the research generated considerable interest and support from the academic community. The original research proposal received the James McKeen Cattell Research Design Award from Division 14 of the American Psychological Association and the first doctoral dissertation (written by a collaborator, Philip Yetton) employing

its concepts and methods received the S. Rains Wallace Doctoral Dissertation Award from that same scientific body.

Equally encouraging have been the results of the research program since that time. Appendix I lists the ten Technical Report publications which have been issued prior to this final report under the contract. Appendix 2 lists the publications which are already in print or in press. The most significant of these works, a 230-page book entitled Leadership and Decision-Making (co-authored with Philip Yetton) published within the last two years, has already received very favorable reviews in such journals as Contemporary Psychology, Administrative Science Quarterly, Personnel Psychology, Sociology: Review of Books and the Sloan Management Review. It has been acclaimed as "the most important piece of work on leadership in the last twenty-five years" and "one of the landmarks in the study of leadership in organizations."

A complete account of the methods and results of this research is beyond the scope of this report and would be redundant with the materials shown in Appendices I and II. We will attempt instead to provide an overview of the contributions of the research along with a road map to technical reports and articles detailing each.

1. Normative Models of Leadership Style. A principal objective of the research program was the development and refinement of a normative model containing a systematic way of choosing from among a finite set of decision processes based on the leader's diagnosis of problem attributes. The earliest form of this model is presented in Technical Report #1, Vroom 1973; and Vroom and Yetton 1973b Chapters 1-3. The model has since undergone several revisions and extensions, the first of these presented

in Vroom and Yetton 1973b Chapter 9; followed by a modest change (Technical Report #5, Vroom and Jago 1974). It is shown in its latest form in Vroom 1976a and 1976b, and in Technical Report #7. The model is most frequently depicted in the form of a decision tree but has also been represented as a battery operated black box and as a computer program operated from a remote terminal.

2. Empirical Validation of the Model. While the models developed have been consistent with available empirical evidence, we recognized both the deficiencies in that evidence and the need to determine empirically the validity of the model and of its separate components. The first such effort, albeit an inconclusive one, was reported in Vroom and Yetton 1973b, Chapter 9. A more conclusive investigation is contained in Technical Report #9. It shows that actual decisions which have employed processes consistent with those of the normative model are substantially more effective than those which depart from the model.

3. New Methods for Studying Leadership. In order to carry out our descriptive research objectives it was necessary to develop new methods for the study of leader behavior including situational factors which impinge upon it. The first of these methods, "recalled problems," has been described in Technical Report #2 and in Vroom and Yetton 1973b (Chapter 4). The qualitative reports of actual decision making situations obtained from the use of this method provided the basis for the development of problem sets, i.e., sets of standardized cases constructed in accordance with a multi-factorial experimental design. Seven different problem sets have been developed ranging in length from 30 to 54 cases. Each permits the assessment of individual differences and of situational influences on leadership style as well as a direct comparison of similarities and

differences between a given leader's behavior and the normative model. The essence of the method and the experimental design underlying the construction of problem sets may be found in Technical Reports #3 and #5 and in Vroom and Yetton 1973b, Chapter 5; Vroom and Jago 1974. Concerns that the problem set measures behavioral intent in hypothetical situations rather than actual behavior have been reduced by a recent study (Technical Report #10) examining the construct validity of this measure.

4. Descriptive Models of Leader Behavior. The evidence, now based on a study of many thousands of managers in over thirty countries and a larger number of organizations, radically undermines the traditional perspective of leader behavior as under the control of a generalized trait (autocratic-participative). Instead this research highlights the role of situational factors both alone (main effects) and in interaction with individual differences as the major sources of variance in leader behavior. The nature of these situational variables and of interactions is explained in Technical Reports #3, #5, and #7; and in Yetton 1972; Vroom and Yetton 1973b, Chapters 5 and 6; Vroom and Jago 1974. Differences in behavior among situations are three to five times as large as mean differences in behavior among individual managers.

5. Perceptual Differences in Leadership Style. As a by-product of research described in #4 above, we identified systematic differences between the way in which a leader perceives his or her own behavior and the way in which that behavior is perceived by subordinates (see Technical Report #6 and Jago and Vroom 1975). Subordinates describe their superiors as substantially more autocratic in their leadership styles than either

the superiors or subordinates describe themselves.

6. Organizational Structure and Leadership Style. The descriptive research has also contributed to the identification of differences in leadership styles exhibited by occupants of different roles in the organization. An early study (Technical Report #5 and Vroom and Jago 1974) showed that groups of managers occupying more homogeneous roles exhibited significant variance (between persons) in their leadership styles than groups of managers occupying less homogeneous roles. More recent research (Technical Report #8, Jago and Vroom 1977, Jago 1977) has examined in depth the effects of hierarchical level on leadership style.

7. Leadership Development and Training. As a by-product to the research endeavor, an approach to leadership training was developed. First described in Vroom and Yetton 1973b Chapter 8, this approach has undergone considerable development and refinement as shown in Vroom 1976b. Training using the concepts of the normative model and based on the results of this research program are integral parts of the management development programs of General Electric, The Army War College, and Bell Telephone Laboratories to name just a few. Early in 1976, Kepner-Tregoe, Inc. of Princeton, New Jersey, introduced a three day leadership training program called Telos, based on the concepts and materials developed in the research. A conservative estimate would place the number of leaders abroad exposed to some version of Vroom-Yetton training at over 35,000 and that number is increasing daily. An investigation to determine the long term effects of this training on managerial behavior and effectiveness is underway. Initial results are highly encouraging.

Appendix I: Technical Reports

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| ONR Tech #1 | Vroom & Yetton | 6/10/72 | 74 pages | "Toward a normative model of leadership style" |
| ONR Tech #2 | Vroom & Yetton | 6/20/72 | 52 pages | "Some descriptive studies of participation in decision-making" |
| ONR Tech #3 | Vroom & Yetton | 1/31/73 | 46 pages | "Leadership behavior on standardized cases" |
| ONR Tech #4 | Vroom | 5/21/73 | 22 pages | "A multi-dimensional measure of leader behavior" |
| ONR Tech #5 | Vroom & Jago | 5/20/74 | 48 pages | "Decision-making as a social process: normative and descriptive models of leader behavior" |
| ONR Tech #6 | Jago & Vroom | 11/18/74 | 38 pages | "Perceptions of leadership style: superior and subordinate descriptions of decision-making behavior" |
| ONR Tech #7 | Vroom | 11/74 | 27 pages | "Leadership revisited" |
| ONR Tech #8 | Jago & Vroom | 9/75 | 44 pages | "Hierarchical level and leadership style: on the resolution of a contradiction" |
| ONR Tech #9 | Vroom & Jago | 4/76 | 38 pages | "On the validity of the Vroom-Yetton model" |
| ONR Tech #10 | Jago & Vroom | 7/76 | 20 pages | "Predicting leader behavior from a measure of behavioral intent" |

Appendix II: Publications

- Yetton, P. W., Participation and leadership style: a descriptive model of a manager's choice of a decision process. Ph.D. dissertation. Carnegie Mellon University 1972.
- Vroom, Victor H. A New Look at Managerial Decision Making. Organizational Dynamics, Spring 1973. 66-80.
- Vroom, Victor H. and Yetton, Philip W. A Normative Model of Leadership Style. In Leavitt, H. and Pondy, L., Readings in Managerial Psychology. Chicago: University of Chicago Press, 1973a. 413-433.
- Vroom, Victor H. and Yetton, Philip W. Leadership and Decision Making. Pittsburgh: University of Pittsburgh Press, 1973b.
- Vroom, Victor H. Decision Making and the Leadership Process. Journal of Contemporary Business, Autumn 1974. 47-64.
- Vroom, Victor H. and Jago, Arthur G. Decision Making as a Social Process: Normative and Descriptive Models of Leader Behavior. Decision Sciences, Vol. 5, No.4, October 1974. 743-769.
- Vroom, Victor H. Leadership Revisited. In Cass and Zimmer (Eds.), Man, Work and Society. Reading, Mass.: Addison-Wesley 1975. 220-234.
- Jago, Arthur G. and Vroom, Victor H. Perceptions of Leadership Style: Superior and Subordinate Descriptions of Decision Making Behavior. In Hunt, J. G. and Larson, L., Leadership Frontiers. Kent State University Press, 1975. 103-120.
- Vroom, Victor H. Leadership. In Dunnette, M. (Ed.), Handbook of Industrial and Organizational Psychology. Chicago: Rand McNally, 1976a. 1527-1552.
- Vroom, Victor H. Can Leaders Learn to Lead? Organizational Dynamics, 1976b. 17-28.
- Jago, Arthur G. and Vroom, Victor H. Hierarchical Level and Leadership Style. Organizational Behavior and Human Performance, 1977, 18, 131-145.
- Jago, Arthur G. Hierarchical level determinants of participative leader behavior. Ph.D. dissertation. Yale University 1977.

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